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The Detection of "Doping"

BY

P. A. MOORE

The Animal Health Trust, Equine Research Station, Newmarket

SUMMARY.—The detection of "doping" in race-horses is discussed. A sensitive chemical method of testing equine secretions for the presence of stimulating drugs is described.

THE administration of "dope" to race-horses and greyhounds is forbidden by racing authorities all over the world. "Dope" may be defined as any drug which effects the speed, stamina, or courage of an animal when given immediately before a race.

In horse-racing, specimens of saliva, sweat, and urine are most often taken from winning horses. In England, this is only done when suspicions are aroused, but in many other countries samples are collected from the winners of every race. In greyhound racing, vomit may also be collected in addition to urine. Losing dogs are sometimes subjected to examination as well.

The "doping" drugs, known to have been administered to race-horses in recent years, are mainly central nervous stimulants and local anaesthetics. Sedatives have been found in greyhounds.

Although it has been universal practice for the past 20 years to have analyses performed, little information has been published on the results obtained or on suitable techniques for identification. Partly for these reasons, the matter has become a topic for popular speculation. Sampling procedure has been discussed by Stewart (1951) and biological *versus* chemical tests by Gellhorn and Morgan (1947). The latter authors concluded that chemical tests were more reliable and sensitive than pharmacological tests on mice.

A major difficulty in detecting "dope" is that the fraction of the original dose of the drug administered, which is likely to be recovered by the chemist, is extremely small. The quantities of the substance to be identified are much smaller than in *post-mortem* toxicology. The larger the volume of fluid collected from the animal, the greater the chance of a positive finding. This matter is especially important when only saliva is sampled, since the volume collected on swabs may be less than 10 ml. Unless the drug has been given orally and traces remain in the mouth, the analyst will have barely sufficient material to extract. In an attempt to increase the volume of saliva taken, some overseas clubs allow the use of acidic mouth-washes. In practice, saliva has been found to be less valuable than sweat or urine for the detection of injected drugs.

It follows that any worth-while chemical method of analysing fluids from animals, alleged to have been "doped," must be sensitive. Hitherto colour and microcrystalline precipitation tests have been favoured, particularly in the United States. These tests are performed on a large scale for the State Racing Commissions, which often do not pay the winning stakes until a negative result has been received from the laboratory. Hence rapid analyses are demanded.

In recent years there have been profound changes in technique with the development of paper chromatography and commercial spectrophotometers. A scheme employing modern methods for the detection of drugs in equine secretions is presented below. Direct extraction is used in preference to the Stas Otto type process, which is now less favoured by toxicologists. Details have been taken from the work of Munier and Macheboeuf (1949) and Mannering *et al.* (1954) on the paper chromatography of alkaloids, and Wickstrom and Salvesen (1952) on amines. The ultra-violet photography technique was originally described by Markham and Smith (1949).

Method

In the procedure described, which is suitable for the detection of stimulants only, 2 extractions are made from alkaline solution. These are conventionally termed B and C extracts. If sedatives are sought, an acid-ether (A extract) would be necessary.

Cotton gauze swabs are used to collect saliva and

sweat. These swabs are extracted 3 times with a sufficient volume of 1 per cent. acetic acid. With sweat solutions, it is convenient to remove fat and protein by means of trichloracetic acid, at a concentration of 5 per cent. With saliva solutions this treatment is omitted.

Reagents

Hydrochloric Acid-Alcohol: 10 ml. of concentrated hydrochloric acid are added to 90 ml. of methanol.

Phosphoric Acid-Alcohol: 0.1 per cent. V/V syrupy phosphoric acid in methanol.

Biomocresol Green Indicator: 1.5 ml. 0.1 N sodium hydroxide are added to 0.1 g. bromocresol green and then acetone to 250 ml.

Potassium Iodoplatinate Solution: 10 ml. of 5 per cent. platinum chloride solution are mixed with 240 ml. of 2 per cent. potassium iodide.

Extraction

Urine, saliva, or sweat fluids are adjusted to *p*H 10 with sodium hydroxide solution in a separator, and shaked with 2 volumes of chloroform (B extract). The chloroform layer is filtered through a cotton-wool plug into a glass dish and 0.1 ml. of hydrochloric acid-alcohol is added before evaporating gently. The aqueous phase in the separator is acidified with 2 N hydrochloric acid, brought to *p*H 9 with 2 N ammonia solution and a second extraction made with 1.5 volumes of chloroform-isopropanol (4 + 1). The solvent layer is filtered through cotton wool and evaporated gently (C extract).

Residues B and C are taken up separately in 2 2.5 ml. volumes each of 0.1 N hydrochloric acid, rubbed with a rubber-tipped glass rod, and washed into 15 ml. separators. B and C extracts are made alkaline with sodium hydroxide and ammonia solutions respectively, and extracted with 2 5 ml. volumes each of chloroform and chloroform-isopropanol (4 + 1) respectively. The combined chloroform (B extract) is washed with 1 ml. of water and 0.1 ml. phosphoric acid-alcohol added before evaporation. C extract is evaporated without acid.

The B residue is dissolved in 0.1 ml. aqueous methanol (1 + 1), and C residue in chloroform-isopropanol (4 + 1) for transference to a paper chromatogram.

TABLE I

PAPER CHROMATOGRAPHIC RESULTS FOLLOWING THE ADDITION OF DRUGS TO URINE

Drug	Added (as base) μg.	Ultra-violet photograph	Spectrophotometer readings, mμ		Reaction to bromocresol green	Reaction to iodoplatinate	Rf. solvent A*	Rf. solvent B†
			Maximum	Minimum				
Extract B								
Amphetamine ...	50	–	–	–	+	+ Light blue	0·72	0·80
Amphetamine ...	10	–	–	–	+	–	0·72	0·80
Antazoline	50	+	–	–	+	+ Blue	0·86	0·90
Atropine	20	–	–	–	–	+ Blue	0·61	0·73
Caffeine	20	+	273	245	–	–	0·76	0·80
Chlorcyclizine ...	50	–	–	–	–	+ Violet	0·87	0·93
Chlorpromazine ...	50	+	241	–	–	+ Violet	0·92 (streak)	0·92
Cocaine	20	–	–	–	–	+ Blue	0·68	0·75
(Double spot)		–	–	–	–	+ Light blue	0·29	0·31
Codeine	50	+	285	263	–	+ Blue	0·52	0·60
Codeine	20	–	–	–	–	+ Blue	0·52	0·60
Dimenhydrinate ...	50	–	–	–	–	+ Violet	0·84	0·91
Emetine	50	+	283	258	+	+ Blue	0·64	0·71
Ephedrine	50	–	–	–	+	–	0·66	0·75
Ethylmorphine ...	50	–	284	262	–	+ Blue	0·62	0·68
Ethylmorphine ...	20	–	–	–	–	+ Blue	0·62	0·68
Hyoscine	50	–	–	–	+	+ Blue	0·52	0·60
Mepyramine ...	20	+	247	270	+	+ Blue	0·71	0·76
Methadone ...	50	–	–	–	+	+ Violet	0·92	0·94
Methylamphetamine	10	–	–	–	+	–	0·74	0·81
Nicotine	20	+	260	–	+	+ Blue-black	0·54	0·56
Nikethamide ...	50	+	260	–	–	+ Yellow	0·94	0·96
Papaverine	50	+	251	–	–	+ Blue	0·73	0·85
Pethidine	50	–	–	–	+	+ Violet	0·84	0·89
Phenadoxone ...	50	–	–	–	–	+ Violet	0·90	0·95
Phenindamine ...	50	+	263	–	+	+ Blue	0·85	0·92
Procaine	50	+	–	245	–	+ Blue	0·59	0·68
Proguanil	50	+	–	–	+	+ Violet	0·88	0·91
Promethazine ...	50	+	295	282	–	+ Violet	0·90	0·93
Quinine	20	+	243	–	+	+ Blue	0·74	0·83
Sparteine	20	–	–	–	+	+ Blue	0·34	0·38
Strychnine	10	+	255	–	–	+ Blue	0·63	0·74
Tripelennamine ...	20	+	310	271	–	+ Blue	0·32	0·36
(Double spot) ...		–	245	–	–	+ Blue	0·13	0·15
Extract C								
N-allylmorphine ...	50	–	–	–	–	+ Blue	0·56	0·64
Morphine	50	–	–	–	–	+ Blue	0·38	0·44

* Solvent A.—Butanol + pentanol + acetic acid + water (2 + 2 + 1 + 1).
† Solvent B.—Butanol + acetic acid + water (6 + 1·5 + 2·5).

Paper Chromatography

Whatman No. 1 paper buffered with M/15 potassium dihydrogen phosphate is used. The solvents are butanol, acetic acid, water (6 + 1.5 + 2.5) and pentanol, butanol, acetic acid, water (2 + 2 + 1 + 1). The solvent is left to ascend for 4 to 5 hours or overnight.

The dried papers are photographed in ultra-violet light at 254 mμ using Ilford Document Paper No. 50. Absorbing spots are marked and their characteristic maxima and minima determined by placing the strips in a Unicam SP.500 spectrophotometer.

The paper strips are then sprayed lightly on each side with bromocresol green and potassium iodoplatinate solutions. The colour and Rf values of spots are noted.

Results and Discussion

Table I gives the results which were obtained when the stated quantity of drug, 10 to 50 μg., was added to 25 ml. of equine urine and subjected to the procedure.

Antihistamine and other drugs have been included because they may be extracted in a similar manner to the alkaloids and they have been stated to give similar colour reactions. This confusion is resolved by using paper chromatography. When the presence of sedative drugs is suspected, a preliminary acid-ether extraction would be necessary. This fraction could then be examined for barbiturates as recommended by Curry (1955). Caffeine may be removed by this extraction.

The scheme provides a rapid means of screening fluids for stimulants. The analysis may be completed on the second working day.

The sensitivity of the method described compares favourably with figures, which have been published by Gellhorn and Morgan (1947), for microcrystalline identification as performed in the New York State Racing Commission Laboratory. Table II shows the minimum amounts of different drugs which can be detected by the 2 procedures. With most substances, especially with the important stimulants amphetamine, caffeine, and strychnine, the overall sensitivity is much improved by means of paper chromatography. Another advantage is that it is possible to resolve mixtures which would be impossible to separate in any other way. The drugs are not destroyed in the process and they may be recovered for conventional tests by cutting out reacting spots from the paper and treating with alkali and solvent. Micro-crystalline data on alkaloids have been published by Clarke and Williams (1955) and by Clarke (1957). It should be noted, however, that the sensitivities recorded are for pure solutions. In the presence of impurities microcrystallisation is usually less satisfactory.

TABLE II

Drug	"Threshold amount" by microcrystalline method	"Positive amount" by microcrystalline method	Amounts giving definite result by paper chromatography
	Gellhorn & Morgan (1947)		
	μg	μg	μg
Amphetamine ...	100	200	10
Atropine ...	50	250	20
Caffeine ...	100	200	20
Cocaine ...	75	100	20
Codeine ...	50	250	20
Ephedrine ...	250	250	50
Morphine ...	20	50	50
Nikethamide ...	1,000	2,000	50
Pethidine ...	100	250	50
Procaine ...	250	1,000	50
Strychnine ...	20	50	10

Natural bases have been observed in equine secretions. These substances could be differentiated from drug spots on the chromatograms. Bases, which were extracted from urine, had lower mobilities than amphetamine or methylamphetamine. A slow-moving substance with an absorption maximum at 258 mμ has been frequently found in saliva and sweat.

Finally, it should be stated that the scheme does not cover every possibility. The metabolism of drugs in the horse has not been considered. However, as indicated above, the examination is necessarily limited by the volume of fluid available.

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I express my gratitude to Mr. Wm. C. Miller, Director, Equine Research Station, for encouragement; to Mr. E. Shepherd for technical assistance; to Messrs. Herd and Mundy and many colleagues overseas for helpful discussion.

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FOOT-AND-MOUTH DISEASE

As we go to press a special Order has been made declaring Hampshire (including the Isle of Wight), Berkshire, Wiltshire and Dorset a Controlled Area to prevent the spread of foot-and-mouth disease.

This exceptional step has been taken because animals exposed to infection were sold at Reading, Salisbury, Shaftesbury and Winchester markets last week. Special action is necessary to stop the further movement of animals and to facilitate the tracing and examination of them.

"This Hexoestrol Business"

UNDER this title, a one-day conference was held at the Douglas Hotel, Aberdeen, on October 17th, to discuss the purpose, practice and implications of the treatment of cattle and sheep to promote growth with the synthetic chemicals, stilboestrol and hexoestrol.

Dr. Dodsworth introduced the subject of the Conference with a review of the effects of male and female hormones on the growth rate of cattle, with an emphasis on the latter, since stilboestrol and hexoestrol simulate the oestrogens physiologically. The results of 17 trials were described in which cattle were given a subcutaneous implant of hexoestrol, or fed a daily dose of 10 mg. hexoestrol in medicated cake. The implant was preferred because it was cheaper, and apparently equally effective. Hexoestrol was preferred to stilboestrol because the former has a less potent effect in the human subject, and is therefore safer for operator, compounder, and the consumer of the treated carcase. The results of the trials suggested that steers (Friesian and Angus crosses), 2 years old, showed an average daily gain over untreated controls of 0.095 lb. for a 3-month period. This weight gain was reflected in an increase of muscle, bone, and water content, with a decrease in fat. Some alteration in the conformation of the carcase was noted with thinning of the sirloin, elevation of the tail-head, and extra fleshing of the thighs and forequarter. The cattle were implanted with doses of hexoestrol ranging from 30 to 120 mg. An implant of 60 mg. was considered to be the optimum dose. Although there was no reference to any clinical side effects it was inferred that doses exceeding 60 mg. were undesirable.

The views of the meat distributors were expressed in the second paper by Mr. Justice, of J. Sainsbury Ltd., who commented on the quality of the joints from treated and untreated carcases. Mr. Justice supported the previous speaker with evidence that indicated that a 60 mg. implant represented the optimum dose of hexoestrol. The meat from animals receiving doses in excess of 60 mg. showed a lack of "marbling" bad flesh colour and undesirable "cowy" characteristics in the conformation of the carcase. The weight increase induced by the 60 mg. implant represented a financial gain to the butcher of ¼d. a lb. In his conclusions Mr. Justice considered that in any comparison between good feeding and implantation, good feeding would give the better quality article.

The results of trials involving all types of sheep were described in the third paper by Mr. Crichton, who indicated that the ability of the sheep to convert food protein to meat protein was raised by 30 per cent. as a result of hexoestrol treatment. As with cattle the consequent weight increase was reflected in lean meat, particularly of the forequarter, and bone. Side effects such as excessive udder development, and in wethers, enlargement of the seminal vesicles and other secondary sex glands were noted. The development of the sex glands may lead to constriction of the urinary tract in wethers. This factor, under feeding conditions which predispose to urinary calculi formation, can lead to losses due to urethral obstruction.

From the results of his experiments Mr. Crichton recommended a single implant of 15 mg. hexoestrol, or the daily feeding of 2 mg. hexoestrol, for wethers of 60 lb. and over. The treated wethers should be fed a diet which would ensure a gain of at least 2 lb. per week. Doses in excess of these amounts could lead to serious side effects. The treatment of ewe lambs caused udder growth which resulted in the down grading of their carcases.

The Veterinary Aspect

Mr. P. L. Shanks read a paper on the veterinary aspects of hexoestrol administration. He said that hormones are essential body secretions produced in small quantities by certain glands. They fulfil a very important rôle in the normal functioning of the various organs. Oestradiol, on which the chemical compound hexoestrol is based, is a secretion from the ovary which is responsible, along with other hormones, for the maintenance of the normal reproductive cycle in the female animal. It is not known exactly how hexoestrol works in promoting the fattening of cattle, but it may be because it neutralises the hormones produced by the accessory male organs of the neutered male.

Hexoestrol and stilboestrol, which is 18 times more potent, are used in veterinary practice for certain disorders of the cow and sow in small doses of the order 1 to 25 mg. The danger of larger and repeated doses is that they upset the normal reproductive cycle and lead to cystic ovaries, with infertility. Such doses would also cause abortion if injected into a pregnant cow or sow.

When injected into a castrated male animal, apart from increasing the fattening rate, hexoestrol produces certain side effects, *e.g.*, riding with risks of fractures, the development of an udder, a high tail head, and risks, especially in sheep, of prolapse of the rectum and/or vagina.

What precautions should be taken when using hexoestrol? It should not be used on breeding animals, except by a veterinary surgeon, otherwise failure to breed is almost certain to follow. It should be used in the dosage recommended so as to avoid the exaggeration of the side effects. It should, for preference, be used by injection so that the dose can be carefully regulated. The site of choice for injection is the ear so that the ear with the implants can be removed and destroyed when the animal is slaughtered. If used in food, the farmer should buy the food already medicated to avoid any carelessness in mixing or overdosing. A further precaution is that offal containing the tablets, *e.g.*, ears, should not be fed to animals such as mink, ferrets, silver foxes, dogs, etc., otherwise breeding troubles will undoubtedly arise.

Are there any human risks associated with its use? So far as has been ascertained, and in America much information is available, the amount of residual hexoestrol in meat is so small as to be insignificant

provided the dosage rates recommended and other precautions are strictly followed.

The Discussion

The discussion was opened by Mr. Norman Black, of Messrs. Boots, who read a prepared statement in which he stated categorically that there was not the slightest risk from hexoestrol treatment of fattening cattle if given by implantation because:—

(a) Hexoestrol is much less potent for man when given orally than is stilboestrol;

(b) Experiments at Nottingham have shown that the amount of oestrogen in muscle tissue from treated animals is less than 1 in 140 million or 1 mg. per 140 lb. meat. It would be quite impossible therefore, for a person to consume even a clinically active dose let alone a toxic amount of hexoestrol. Indeed, the amounts in meat are much less than the quantities of naturally occurring oestrogen in many foods including milk, cereals, green vegetables, etc.

Mr. Black was of the opinion, therefore, that there was not the slightest risk of harmful effects such as cancer developing following even long-term repeated administration of the small amounts present in treated meat, but it would obviously take a long time to prove conclusively that there was, in fact, absolutely no danger. Should we then withhold the obvious benefits until we could confirm that nothing untoward happened? So long as overdosage was avoided it was his view that we should accept the calculated negligible risk in order to secure the advantages.

Mr. Black was challenged by various members of the Scottish Housewives Association who doubted his confident assurances and asked for concrete guarantees of safety from all possible long-term harmful effects on fertility, off-spring, etc. In their view the authorities should demonstrate clearly that there were no harmful long-term effects before sanctioning the use of the benefit. They put forward a plea that carcases of animals treated with hexoestrol should be labelled as such, and warned that consumption of meat would decline unless some control measures were introduced.

Mr. Bindloss, of B.O.C.M., said that while this was not the place to enter into any discussion of the relative merits of implantation and feeding of hexoestrol he certainly would support Mr. Black's view of there being very little danger in the light of extensive American experience with this method. He would be prepared to accept the general cautionary rules laid down by Shanks, and felt that if the material were used at the correct rates on the right kind of animals there would be undoubted benefits without any danger.

Dr. Alan Fraser, Aberdeen University, sounded a note of caution and of support for the housewives. He felt that the results quoted by the speakers required more careful statistical analysis before being accepted at their face value. The butcher's verdict was to his mind important: until they were satisfied he felt that farmers should be very chary of adopting the method. In his view the question of "side-effects" had been glossed over. These side-effects, as they were called, were in reality pathological phenomena, and if the average housewife got to know about them she would turn vegetarian. He emphasised that the research was obviously still in the embryo stage and should be kept as such until more was known about the subject.

Mr. J. A. Crichton, of the Rowett Research Institute, stated that he understood that the Agricultural Research Council had already asked the medical authorities for their views and he believed that these were that the danger was negligible in view of the small amounts of hexoestrol in the flesh. He had also been informed that experiments had shown that the consumption of flesh from hexoestrol fed pigs over a considerable period had been found to have no adverse effects.

Mr. F. A. Davidson, veterinary officer, Animal Health Division, Aberdeen, said that speaking as a meat inspector he wondered if those treated carcases could really be regarded as being of the substance and quality demanded by the public. In his experience the carcases were moister and greasier than normal and he was doubtful if they would stand up to cold storage. He feared also that Shanks's warnings would be transgressed sooner or later. If put into feeding-stuffs hexoestrol would eventually get into every animal on the place, while implantation of tablets could be more difficult than many farmers realised, particularly with cross-bullocks under ordinary farming conditions. It was his view that the whole matter had been publicised at far too early a stage.

Mr. Nicol (farmer), suggested that science was now undoing all the good work of their forefathers in breeding first-quality beef cattle. From the picture they had been shown he was quite satisfied that no carcases of treated animals would ever stand any chance of acceptance in a carcase quality competition.

Mr. Parkinson, of the North of Scotland College of Agriculture, said that they had been criticised in the meeting for going ahead with this experiment too quickly, but until tried out on a field scale it was impossible to judge its potentialities. In his view far too much fuss had been made of potential dangers in view of the fact that the amounts of oestrogen in meat was far less than would be encountered in many ordinary foodstuffs and far less than would be found in the tissues of a normal pregnant cow.

The chairman, Mr. J. Mackie, summing up, said that the discussion had not been very objective but it did seem as if this technique could be useful if discretion were observed. There were undoubted financial benefits which must be taken into consideration, but he felt the situation required careful handling and they must take care not to lose their skill in husbandry and feeding. Farmers would need to make up their minds about methods of administration and whether they were to support Boots or B.O.C.M.! He had a good deal of sympathy with the housewives' attitude and they certainly should not ignore the possibility of cumulative effects over a long period. He also agreed that treated meat should be appropriately labelled in the shops.

(*Concluded at foot of col. 1 overleaf*)

Negative Staining for the Study of Sperm Morphology

BY

C. KRISHNA RAO

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SUMMARY.—A large number of biological stains were subjected to a critical study to determine their suitability as negative stains for sperm.

Among the stains giving a blue background 5 to 7 per cent. aniline blue w.s., 3 to 5 per cent. Blue de Lyon, china blue, cotton blue and soluble blue, 7 per cent. methyl blue, 1:2 to 1:4 dilution of the stock opal blue (Bresslau) solution and ultramarine blue waterproof ink gave the best results. Two per cent. Congo red and 5 per cent. Congo rubin preparations post-treated with HCl were also very good.

Of the stains providing a greenish background, 5 per cent. new black, 10 per cent. naphthol blue and 2 to 3 per cent. fast green gave the best results. Among stains providing a yellow, orange or reddish background 5 per cent. Congo rubin and crimson lake waterproof ink gave the best results. Indian ink. and 5 to 7 per cent. indulin and nigrosin also gave excellent results.

It is essential to dissolve the stains in isotonic salt solutions to avoid artefacts. Negative staining technique is recommended for routine use in artificial insemination work in view of the simplicity of the technique, rapidity of the process and excellent staining results. With avian sperm in particular sperm structure is well preserved and clearly delineated.

ALTHOUGH the technique of negative staining has been used quite extensively in the past for the negative demonstration of various types of micro-organisms, its use for the study of sperm morphology, is of recent origin. Indian ink was extensively used by a large number of investigators (Ehrenberg, 1838; Burri, 1909; Harrison, 1912; Niklitschek, 1939) as a negative stain. Harrison (1912) and Knisely (1939) employed Collargol for the negative demonstration of Treponema Pallida. Bresslau (1921) introduced opal blue and "Cyanochin" for the demonstration of blood parasites. Nigrosin was another widely used negative stain. Butt, Boynge and Joyce (1940) employed azo blue for the negative demonstration of capsular zones about haemolytic streptococci.

The technique of negative staining was used to a limited extent for the study of sperm morphology. Opal blue was used by Lagerlof (1934; 1936) and Rao and Hart (1948). Hancock (1947) used nigrosin for the study of abnormal acrosomes of bull sperm. Recently Rao (1953) reported the suitability of a large number of stains for the negative demonstration of sperm.

Materials and Methods

Semen of the buffalo-bull, bull and rooster were used for this study. Both the semen and material from the epididymis were studied. Only undiluted semen was used for these studies. A number of biological stains of various strengths in double-distilled water or isotonic salt solutions were tested for their suitability as negative stains for sperm. The isotonic solutions used were either normal saline, 3 per cent. sodium citrate (dihydrate), or M/8 phosphate buffer (Ph 7.3-7.4) made according to Mayer *et al.* (1951).

The actual staining process and technique of preparing the semen smears were according to Mayer *et al.* (1951). Keeping the slides in a slanting position during the drying process was found to help in draining the excess of the semen-stain mixture towards one end of the slide, thereby furnishing a more uniform background. When counting of sperm was required for classification into various groups, just 100 sperm distributed over a wide area of the smear were counted (Comstock *et al.*, 1943: Mercier & Salisbury 1945).

Results

For the sake of convenience, stains used in this study were grouped according to the type of background furnished.

Stains that furnish a blue to a bluish-violet background

A large number of stains giving a blue or bluish-violet background were studied. In presenting the results, in view of the similarity of results obtained with a large number of blue stains and to avoid repetition of statements, full details regarding the experimental work conducted with aniline blue are presented. The other stains were also subjected to the same kind of study as aniline blue and results with them presented in a tabular form for the sake of brevity.

Aniline Blue

Five to 7 per cent. aqueous solutions of aniline blue gave the best results as negative stains for sperm. Solutions stronger than 7 per cent. were unsatisfactory in view of the intense blue background which tended to obscure sperm morphology while those weaker than 5 per cent. gave too light a background to provide sufficient contrast to the unstained sperm. The background was deep blue and very similar to that obtained with opal blue (Bresslau) and the majority of sperm in fresh semen appeared unstained and whitish-looking with remarkable clarity. The remainder of the sperm could be seen to take a bluish colour in the region of the post-nuclear cap. The cytoplasmic cap on most of the sperm was very

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"This Hexoestrol Business."—*Concluded.*

He felt that the correct body to guide them in this matter was the Medical Research Council and it certainly had not been of much assistance as yet. Research was obviously still necessary if they were to allay public fears and a lot more work was required to be done from the agricultural aspect before the method could be widely adopted. The latter, he felt, was the responsibility of the Agricultural Research Council. He entered a plea that these two Councils should come out into the open and give the farmers guidance.

prominent as a structure with a wavy outline going all round the acrosome and stopping abruptly at the dividing line between this region and the post-nuclear cap. In preparations with the material from the tail of the epididymis the cytoplasmic drops were brilliantly brought out as whitish globular bodies against the blue background.

Significance of Stained Sperm

The number of sperm taking the stain was found to increase with the storage of semen and the decrease in the grade of sperm motility, indicating that the proportion of stained sperm is related to the increase in the number of dead sperm in the semen sample. Fresh semen samples to which a small quantity of a 5 per cent. aqueous formalin was added to kill the sperm was found to give preparations in which practically all the sperm took the blue stain, whereas control samples had a high percentage of unstained sperm.

TABLE I

OVER-ALL MEAN PROPORTION OF STAINED AND UNSTAINED SPERM IN FRESH AND STORED UNDILUTED BULL SEMEN (STORAGE AT 45°F.) USING 5 PER CENT. AQUEOUS ANILINE BLUE

Number of samples	Duration of storage	Motility grade	Unstained sperm per cent.	Stained sperm per cent.
10	Fresh semen	Good	77·0	23·0
	1 day old	Medium	63·0	37·0
	2 days old	Fair	48·2	51·8
	3 days old	Poor	28·2	61·8

TABLE II

OVER-ALL MEAN PROPORTION OF UNSTAINED SPERM IN FRESH AND FORMALINISED BULL SEMEN USING 5 PER CENT. AQUEOUS SOLUTION OF ANILINE BLUE

Number of samples	Type of semen	Stained sperm per cent.	Unstained sperm per cent.
10	Fresh semen	20·8	79·2
	Formalinised semen	96·0	4·0

The very high proportion of stained sperm in formalinised semen as against the high proportion of unstained sperm in control samples indicates that the live sperm do not take the stain and that staining of the dead sperm only occurs. To confirm this hypothesis, a small drop of semen was diluted with a large drop of normal saline to allow for high dilution and wide dispersal of the sperm, and a cover-slip was then dropped on this diluted semen. A small drop of 5 per cent. aniline blue was applied to the edge of the cover-slip and the stain sucked across the thin film of semen by applying blotting paper to the opposite end. In these preparation it could be seen that the live, actively motile sperm did not take the stain, while the non-motile and presumably dead or dying sperm readily took up the stain. When some of the motile unstained sperm were followed under the microscope these were found to become non-motile after some time and then take the stain. The stain first entered the head in the region of the post-nuclear cap and then extended to the rest of the sperm cell.

In another experiment a small drop of semen was diluted in the same manner as described above and a little drop of stain sucked across. After noting that the actively motile sperm did not take the stain a small drop of 5 per cent. aqueous formalin was applied to the edge of the cover-slip (to kill the sperm) and sucked across by applying blotting paper to the opposite edge. In such preparations the motility of the sperm immediately declined and the motile sperm soon became stationary and then took the stain. Thus, it can be inferred that only the dead sperm take the stain while the live ones remain impenetrable to the stain.

Isotonicity of Stain Solution

Since a 5 per cent. aqueous solution of aniline blue is not isotonic with semen, and may kill a few sperm thereby causing them to take the stain, it was felt necessary to study the proportion of the unstained sperm in preparations made with 5 per cent. aqueous aniline blue and 5 per cent. stain in M/8 phosphate buffer. Further, since mixture of fresh semen with aqueous solutions may bring about certain artefacts like bent-tailed sperm, comparative experiments were conducted using the aqueous stain as well as the same dissolved in M/8 phosphate buffer.

From the data presented in Table III it is evident that aqueous solutions of aniline blue give a larger percentage of stained sperm and larger proportion of bent-tailed sperm than solutions of the same in phosphate buffer. It is therefore, essential that for the negative staining of sperm the stain solution has to be prepared in an isotonic solution like M/8 phosphate buffer, normal saline or 3 per cent. sodium citrate (dihydrate) in distilled water, to avoid artefacts like bent-tailed sperm.

The results obtained with the other blue stains that proved satisfactory for negative staining are presented in Table IV and aniline blue has also been included in this table (overleaf).

The water-proof inks mentioned gave true negative staining, none of the sperm taking any stain at all irrespective of the quality of semen. Blue de Lyon and thionine gave a bluish-violet background. Congo red gave a deep saffron background to the preparations, while Congo rubin provided a reddish-saffron

TABLE III

MEAN PROPORTION OF STAINED SPERM AND ABNORMAL SPERM IN PREPARATIONS WITH 5 PER CENT. AQUEOUS ANILINE BLUE AND 5 PER CENT. ANILINE BLUE IN PHOSPHATE BUFFER

	Stain employed	Number of samples	Unstained sperm per cent.	Stained sperm per cent.	Bent-tailed sperm per cent.	Other abnormals per cent.	Normals per cent.
1.	5 per cent. aqueous aniline blue w.s.	10	79·7	20·3	17·0	4·8	78·2
2.	5 per cent. aniline blue w.s. in phosphate buffer	10	88·0	12·0	4·4	4·6	91·0

TABLE IV

Name of stain and optimum concentration	Remarks
I.—Negative stains that furnish a blue to a bluish violet background	
5 to 7 per cent. aniline blue, 3 to 5 per cent. blue de Lyon, china blue, cotton blue, and soluble blue, 7 per cent. methyl blue, 1 : 4 aqueous dilution of opal blue Bresslau Losung and 1 per cent. of saturated aqueous solution of thionine	Background deep blue against which sperm morphology, cytoplasmic caps and cytoplasmic drops were clearly visible. Sperm in fresh semen were differentiated into stained and unstained groups. Smears do not fade for over 2 years except in the case of methyl blue. Opal blue smears do not fade for over 5 years.
2 per cent. Congo red and 5 per cent. Congo rubin ...	Treatment of smears with HCl turns background blue. Sperm in fresh semen differentiated into two groups as above.
Waterproof inks—ultramarine blue tint, cobalt blue tint and Prussian blue tint	Background was deep blue. None of the sperm took the stain. Cytoplasmic caps and drops were clearly brought out. Smears do not fade for over 2 years.
II.—Negative stains that furnish a greenish background.	
5 per cent. Light green S.F. and acid green	Background was deep green and granular. Sperm were differentiated into 2 groups. Preparations made in a few months.
2 to 3 per cent. fast green F.C.F.	Background was deep bluish-green and granular. Sperm were differentiated into 2 groups. Preparations do not fade over 1 year.
10 per cent. naphthol green	Background was smooth olive-green. Sperm were differentiated into 2 groups.
5 per cent. new black	Background was deep moss-green and non-granular Sperm were differentiated into 2 groups. Preparations do not fade for over 2 years.
III.—Stains that furnish a yellow, orange or reddish background.	
10 to 15 per cent. Argyrol and 15 to 20 per cent. Mild Silver proteinate	Background was golden yellow and none of the sperm took stain. Cytoplasmic, caps and drops were very clearly brought out. Smears do not keep well for more than 4 to 6 weeks.
2 per cent. Congo red and 5 per cent. Congo rubin ...	Deep saffron or reddish-saffron background. Sperm were differentiated into 2 groups.
Waterproof inks—burnt sienna tint, crimson lake tint, scarlet tint	Background was deep mahogany, bright crimson or deep reddish-orange as the case may be. None of the sperm took any stain. Cytoplasmic caps and drops were clearly brought out. Smears do not fade for over 2 years.
IV.—Stains that furnish background of any other colour.	
1 per cent. or saturated aqueous chlorazol black E. ...	Background was dull black to steel grey. Sperm were differentiated into 2 groups.
Indian ink	Background was blackish-brown and granular. None of the sperm take any stain cytoplasmic caps and drops were clearly brought out. Smears do not fade for over 5 years.
5 to 7 per cent. indulin and nigrosin	Background was dull blackish-violet or brownish-violet. Sperm were differentiated into 2 groups and cytoplasmic caps and drops very well demonstrated. Smears do not fade for over 4 years.

background. When these smears were treated with HCl the background took a deep blue to a bluish-violet colour and preparations were superior to untreated smears. The blue colour faded in a few weeks back to the original colour, but could be restored by repeating the acid treatment. Three types of acid treatment were tried to determine the best formula for blueing the smears:—

1. Treatment of smears with 0.1 to 1.0 per cent. concentrated HCl.

2. Treatment of smears with 0.1 to 1.0 per cent. concentrated HCl in 95 per cent. ethyl alcohol.

3. Exposing smears to concentrated HCl fumes.

Concentrations of aqueous and alcoholic HCl ranging from 0.5 to 1 per cent. gave blue colour of the same intensity, and preparations treated with similar strengths of aqueous or alcoholic HCl gave the same shade of blue. One per cent. aqueous or alcoholic HCl is, therefore, recommended for routine use. The duration of exposure to the acid also did not influence the depth of blue colour. The blueing was spontaneous and smears could be taken out immediately after dipping in the acid. Blueing with acid fumes was also rapid and smears showed less tendency to develop cracks.

Of all the negative stains listed, those with a blue or bluish-violet background gave the best results followed by Indian ink, indulin, nigrosin and crimson lake tint waterproof ink. Azoblau, Berlinerblau, Berlinerblau Leichtlosl, Berlin blue, night blue, Nile blue and toluidine blue proved to be unsatisfactory as negative stains for sperm, although reported to be successful with bacteria (Butt, Boynge & Joyce, 1936; Cumley, 1935).

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Honorary Membership of the B.V.A. Conferred upon Mr. H. E. Bywater

As published previously in THE VETERINARY RECORD, the Association decided, as a memento of Mr. Bywater's long and great services as Honorary Treasurer, to present him with an armchair, and to create him an Honorary Member. The material gift was made to him some little time ago, and the Honorary Membership was conferred at the meeting of Council on Friday, November 15th. Addressing him, the President said:—

"Mr. Bywater, it gives me the greatest pleasure to present you with this Certificate of Honorary Membership. The words I have to say will not adequately do justice to what you have done for the Association but, believe me, we do appreciate very much your tremendous work in the past, and we look forward to a full measure of that wonderful work in the future. We are very glad indeed to have you back in the Council, and we congratulate the Division which had the good sense to see that you returned here." (*Applause.*)

Mr. H. E. Bywater, in response, thanked the President for the very kindly terms he had used in making the presentation. He also thanked Mr. Alan Wright for having proposed that he should be made an Honorary Member of the Association, and members of Council for having so generously supported that proposition. It would be unnatural if he were not rather proud at that moment, but when he recalled and reflected on the very small, though select, list of names on the Scroll of Honorary Membership, any pride he had was engulfed in a flood of humility at his unworthiness to be so elected.

It was also tincturèd with a measure of sadness at the passing of one who was such an eminent member of the profession and an Honorary Member of the Association. At the same time, Mr. Bywater said he was grateful he had been privileged to know the late Professor Wooldridge, and gave thanks for a life well spent.

Service to the Association did entail a certain amount of personal inconvenience, and he had always felt that it was up to those who were not engaged in private practice to do their full measure, because it did not impose upon them such personal sacrifice. At that juncture he desired to express appreciation of the fact that his wife had been so tolerant with him and had encouraged him in the work he had done for the B.V.A. He recalled that he was presented with an armchair by the President, and pointed out that he had duplicated it, not so much in order to prevent any arguments in his house, but as a measure of appreciation of the way in which Mrs. Bywater had looked after his creature comforts.

It was said that it was more blessed to give than to receive, continued Mr. Bywater. That was open to debate, but there was certainly pleasure in giving as well as receiving, and he asked the President to accept a small gift from him. The Past-Presidents of the Association had been hampered by the fact that there was no miniature of the Presidential badge of office for them to wear when attending the functions of other bodies or of Divisions. It had in the past been necessary to detach the quite unwieldy medallion from the Presidential chain and tie it round the neck of the President with a piece of ribbon! That disability had been more apparent in recent years as the Association had grown in stature, but as Honorary Treasurer he could not bring himself to think that it would be a justifiable expense to indulge in mere window dressing! (*Laughter.*) In any case, the problem was a passing one—like the President. However, he did not desire the Presidents to harbour any harsh feelings for him in that respect, and he therefore asked Mr. Ingram to receive on behalf of the past, present, and future Presidents of the Association a miniature of the Presidential badge of office as a token of his (Mr. Bywater's) appreciation of the way the Officers had always shown kindness and tolerance to one who must often have been an irritating and obstinate Honorary Treasurer! (*Applause.*)

The President expressed the Council's warmest thanks to Mr. Bywater for his very kind words and for his magnificent gift. It would be deeply appreciated even by those who would not have the honour of wearing it.

Mr. E. Wilkinson, speaking on behalf of the Past-Presidents who were not present, said he desired to support that which the President had said about Mr. Bywater. Only those who had been through the Chair knew of the multitudinous acts of kindness which he and Mrs. Bywater went out of their way to perform, particularly during the Congress meetings, and it was appropriate that an expression of appreciation should go on record.

Negative Staining for the Study of Sperm Morphology.—*Concluded.*

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The Royal Agricultural Society of England, the National Farmers' Union, and the Fatstock Marketing Corporation have sent a telegram to the Minister of Agriculture viewing with alarm the latest extension of foot-and-mouth disease. The Minister is requested to give most urgent consideration to more effective measures which should be taken by the Argentine authorities to prevent transmission of infection to this country through shipments of chilled and frozen meat.

News and Comment

ELECTION OF MEMBERS OF THE R.C.V.S. COUNCIL

The following Statutory Notice is published at the request of the Royal College:—

In accordance with the provisions of the Veterinary Surgeons Act, 1948, five members of the said Council, who must be members of the Royal College, will be elected in 1958 by members of the Royal College residing outside the Republic of Ireland.

Five present members of Council will retire at the Annual General Meeting in 1958 and are eligible for re-election, namely:—

A. J. Wright, Esq.
Professor C. Formston.
J. F. D. Tutt, Esq.
Miss J. O. Joshua.
H. Holroyd, Esq.

Nominations of persons for election to the Council must be submitted in writing on a form which may be obtained from the undersigned, and which must be returned to him duly completed before January 31st, 1958.

Each such nomination form must bear the signature of the proposer and seconder, who must not be present members of Council, and must be countersigned by the nominee.

W. G. R. OATES,
Registrar.

Veterinary Surgeons Acts, 1881-1948

9, Red Lion Square,
London, W.C.1.

THE HUSBANDRY AND DISEASES OF CALVES

In our issue of October 12th a paragraph was published referring to the dispatch of this new handbook to members, and asking that anyone who had not received a copy should notify the Editor of this journal. Only two replies were received, but there is reason to believe that quite a number of members are still without copies. May we, therefore, again invite those who have not received the booklet to notify us?

THE WELLCOME RESEARCH LABORATORIES

For the first time in their history the Wellcome Research Laboratories at Beckenham were "at home" to the press on Wednesday, November 13th. Although the tour was planned to give a comprehensive picture of poliomyelitis vaccine production, it also gave an insight into the production of other vaccines and sera and illustrated the close links which exist between human and veterinary medicine in these particular fields.

As polio virus has to be grown in tissue cultures made from monkey kidneys the Wellcome Foundation imports some 10,000 rhesus monkeys a year. The monkeys are flown in from India in a chartered aeroplane specially adapted for this purpose. Recently, certain species of West African monkeys have also been bought and their kidneys tried for vaccine production. A large new laboratory has been built at a cost of £250,000 for the commercial production of polio vaccine and it is estimated that some 4 million doses will be made available each year.

Great care is taken of the live monkeys to ensure that they are in good health prior to use and there is a special quarantine section for animals which may have become sick. After the administration of a fatal dose of anaesthetic the kidneys are removed in a sterile room and the carcase is then passed to another room for *post-mortem* examination. If the monkey proves to be healthy the kidneys are sent forward for dissection and the carcase is destroyed. The chopped-up kidneys are treated with trypsin to provide a suspension of kidney cells. This suspension, together with a suitable nutrient fluid, is incubated for a number of days. The medium is then removed and replaced by a different nutrient fluid, the virus is added, and bottles are incubated for a second time. Finally, the virus suspension is collected and inactivated by formalin. Vaccine prepared in this way is subjected to various stringent safety and other tests, both by these Laboratories and independently by the Medical Research Council.

Two new buildings of identical size are under construction for work in the virus field: one is destined exclusively for research and development on new as well as existing vaccines, and the second will be devoted to the production of other virus vaccines. Notable among the vaccines which have already been pioneered by the Wellcome Foundation is the egg-adapted "living" virus vaccine for canine distemper. The Laboratories are also the only producers in Britain of a vaccine against yellow fever for use in human medicine. A third building is also planned for the development and production of veterinary biological products. During the past 5 years demands for these products, in particular antisera and vaccines for the control of lamb dysentery and pulpy kidney disease in sheep, have increased so much that there is a shortage throughout the world.

Over 500 horses of the light "vanner" type are stabled at Beckenham and from them, under ideal conditions which are carefully watched by the Ministry of Health and the Ministry of Agriculture, antitoxins for the control of lamb dysentery and pulpy kidney disease, swine erysipelas, tetanus, and many other human and veterinary ailments are produced. Most of the horses enter the stables at about 4 to 5 years of age. They are hyperimmunised by the injection of a series of increasing doses of antigen and are bled when test samples of their blood show a satisfactory antibody content. Up to 8 litres can be taken and after 2 or 3 such bleedings the horses are rested for several weeks. Further courses of hyperimmunising injections and bleeding follow at intervals of about 6 weeks and the horses may continue to produce good value antitoxins for several years. The stables are under daily veterinary supervision and are the largest of their kind in this country.

THE REGISTER OF VETERINARY SURGEONS

Under Section 25 (4) of the Veterinary Surgeons Act, 1948, and the provisions of Statutory Instrument No. 1729 of 1957, the names of the under-mentioned members were restored to the Register of Veterinary Surgeons on the dates indicated:—

Mr. Joseph Alfred Morris, 4, Montague Road, Hounslow, Middlesex, November 9th; Mr. Francis William Chamberlain, Cheam Village, Sutton, Surrey, November 11th; Mr. Hugh Black Watson, Rose Cottage, Dalry, Castle Douglas, Kirkcudbrightshire, November 11th; Mr. Ronald Stewart White, Penn House, Hove Park Villas, Hove, 4, Sussex, November 12th; Mr. Maxwell de Gruchy Savage, 30, Poole Road, Bournemouth, Hants, November 13th; Mr. Samuel Smith, Winton Lodge, North Parade, Horsham, Sussex, November 13th; and Mr. Eric Alfred Leaver, Woodborough, High Street, Banstead, Surrey, November 14th.

EXPERIMENTAL IMPORTATION OF BULLS OF THE CHAROLLAIS BREED

A statement by the executive committee of the National Cattle Breeders' Association reads as follows:—

After being consulted by the Ministry of Agriculture, the committee has carefully considered the tentative suggestion that a number of bulls of the Charollais breed should be imported into this country from France for the purpose of experiments to improve the supply of beef from the dairy herds of this country. The committee fully recognises the importance of the supply of beef obtained by using beef bulls on dairy cows which are not suitable for breeding replacements for the national dairy herd, but there is no evidence whatsoever that the Charollais breed is in any way equal for the production of beef to a number of the breeds already so well established in this country, and supreme for beef production throughout the world.

It is the view of this Association that the policy adopted by the Ministry of Agriculture of using only " colour-marking " bulls in the artificial insemination service has limited the full use of all native breeds for the production of beef as a by-product of the national dairy herd. It is hoped that the Ministry will now relax this arbitrary rule.

The attention of the Ministry is also being drawn to the very considerable danger from disease, both to our own cattle and our export trade in beef cattle, inherent in an importation, particularly from a country where foot-and-mouth disease is endemic. For these and other reasons the executive committee have unanimously decided that these tentative proposals are both undesirable and ill advised, and have made the strongest representations to the Ministry.

THE LIVESTOCK EXPORT GROUP

The Group reports that of the total 162 head exported in the quarter July–September, 1957, 61 were cattle, 45 sheep (to Eire), and 56 pigs (North America). The cattle figure represents 6 to Eire, 8 to New Zealand, and 47 to North America.

The first 6 months of this year showed a slight fall of 9½ per cent. in pedigree stock exports, whose total figure amounted to 988 compared with 1,072 for the first half of 1956. Nevertheless, another section of pedigree animals, horses and ponies did well—their exports rose from 37 to 215 during the period under review.

The British Landrace once again headed the pig popularity poll. Next was the Large White, with the Wessex Saddleback third.

Among cattle, Aberdeen-Angus remained to the fore with a total export of 200, followed by a tie for second place between Herefords 118 and Scotch Shorthorns 118.

Ayrshires topped the list in the dairy breeds with a total export of 74.

MYXOMATOSIS

In the House of Commons last week Mr. J. B. Godber, Joint Parliamentary Secretary to the Ministry of Agriculture, said that rabbits were increasing in many areas. A Bill to permit the artificial spreading of myxomatosis has been introduced in the House of Lords by Lord Dynevor. This would have the effect, if passed into law, of repealing that part of the Pests Act of 1954 which prohibits the use of rabbits infected with myxomatosis for spreading the disease among uninfected rabbits.

A NEW EXPERIMENTAL FARM

Messrs. Glaxo have recently opened a new experimental farm at Harefield, Middlesex. This farm, which will cover 80 acres, includes an isolation compound, a laboratory, a *post-mortem* room, a breeding compound for pigs, and a holding unit for the rhesus monkeys used in the Company's work on poliomyelitis.

The main work on the farm will be the investigation of infectious diseases, especially those of pigs. The buildings in the isolation compound are fly-proof and bird-proof, and very strict precautions will be taken against the spread of infection. The Company's therapeutic agents and vaccines will be tested before being put on the market, and nutritional studies will be carried out. It is hoped that the farm will eventually breed all the animals used for the Company's experimental work.

MEMORIAL SERVICE TO EMERITUS PROFESSOR G. H. WOOLDRIDGE

A memorial service to this great and much beloved member of the profession was held in Holy Trinity Church, Kingsway, on November 15th. The service was conducted by Prebendary W. L. Cottrell, and the Address was given by The Rev. G. A. Willis, B.V.SC., M.R.C.V.S. The Council of the B.V.A. was adjourned in order that the Officers and members might be present at the service, the Council of the R.C.V.S. was represented by the President, Mr. G. N. Gould, and a number of his colleagues including Dr. Glover, the Principal of the Royal Veterinary College, so that in addition to members of Professor

Wooldridge's family, and private friends, the church was filled by leading members of the profession.

In his admirable Address, Mr. Willis, having dwelt upon Professor Wooldridge's academic and public honours, recalled the great changes in veterinary life during his long professional career. It was to him, and to others of like ideals, that much of the advance was due. His services to the veterinary profession had been inestimable.

Yet he would be remembered, Mr. Willis went on, as much for his personality as for his works. Generations of students would remember him not only as a great teacher but as a dear friend. In his case the nickname " Uncle " was the measure of the warmth of the esteem in which he had been held. He seemed to follow every student's career with close and personal interest, and knew, many years after they had graduated, just where they were working and how they were getting on. It was as though, meeting Professor Wooldridge again after a lapse of years, one took up a conversation which had only the previous day been broken off. His name would be spoken, for generations to come, with the deepest respect, affection, and gratitude.

Among those present were:—

Mrs. Wooldridge (widow), Dr. W. R. Wooldridge, Mr. and Mrs. F. R. Wooldridge, Mr. and Mrs. W. E. Wooldridge, Mr. and Mrs. Cyril H. King, Mr. and Mrs. Neville King and Mr. J. King (nephews and nieces), Mr. John Wooldridge, Mr. John R. King and Mr. A. Shenton (great-nephews).

Mr. J. M. Ingram (President of the British Veterinary Association), Mr. H. F. C. Hebeler (Junior Vice-President of the B.V.A.), Mr. E. R. Callender (Senior Vice-President of the B.V.A.), Mr. D. F. Oliver (Hon. Secretary), Mr. E. Cotchin (Hon. Treasurer), and Mr. F. Knight (General Secretary).

Mr. G. N. Gould (President of the Royal College of Veterinary Surgeons) and Mrs. Gould, Professor T. J. Bosworth (Junior Vice-President of the R.C.V.S.), Professor L. P. Pugh (Senior Vice-President of the R.C.V.S.) and Mrs. Pugh, Mr. W. G. R. Oates (Registrar and Secretary) and Mrs. Oates, Mr. H. Sumner (Hon. Treasurer of the R.C.V.S.).

Dr. R. E. Glover (Principal of the Royal Veterinary College) and Mrs. Glover, Mr. H. W. J. Adams (Secretary and Bursar of the Royal Veterinary College), Professor Alex. Robertson (representing the Royal (Dick) School of Veterinary Studies), Mr. S. Jennings (representing the University of Glasgow Veterinary School), Dr. R. N. Smith (representing the University of Bristol Veterinary School and Professor C. W. Ottaway), Dr. Storie Pugh (representing the Cambridge School of Veterinary Medicine), Professor H. G. Lamont (representing Queen's University, Belfast).

Mr. W. C. Miller (Director of the Equine Research Station, Animal Health Trust) and Mrs. Miller, Mr. S. F. J. Hodgman (Director of the Canine Research Station, A.H.T.), Dr. R. F. Gordon (Director of the Houghton Poultry Research Station), Dr. K. C. Sellers (Director of the Farm Livestock Research Station, A.H.T.), Mr. L. Neck (General Secretary of the Animal Health Trust) and Mr. J. Mason (Assistant Secretary).

Sir Jocelyn Lucas, M.P., Dr. J. F. Lockwood (Vice-Chancellor of the University of London), Mr. G. Clark, Mr. J. N. Ritchie (Chief Veterinary Officer) and Mrs. Ritchie, Dr. A. W. Stableforth (Director of Veterinary Research, Ministry of Agriculture), Professor J. McCunn (Hon. Treasurer of the Victoria Veterinary Benevolent Fund), Major J. J. Dunlop (Hon. Secretary of the V.V.B.F.) and Mr. C. W. Francis (Secretary of the V.V.B.F.), the Rev. H. Hughes Riley and other representatives of the Staffordshire Society, and London Staffordshire Lodge and Chapter of Freemasons, Mr. R. S. Yates, Mr. E. J. Pickett Garratt (Royal Jubilee Chapter No. 72), Mr. Donald G. Robertson (A. Robertson and Sons), Mr. and Mrs. Frank Howard and other members of Hendon Bowling Club.

THE CENTRAL VETERINARY SOCIETY

The Society has arranged an interesting meeting for December 5th at the Royal Veterinary College, when Professor J. Z. Young, Professor of Anatomy at University College, London, will address the Fellows and their guests on the subject of Memory. He will discuss some of the more general implications of the ideas of memory in living systems, and particularly the mechanism by which learning takes place in the nervous system.

THE ROYAL VETERINARY COLLEGE ASSOCIATION

The second annual general meeting of the Royal Veterinary College Association was held at the College, on November 8th, in the presence of the Patron, Dr. R. E. Glover, Principal and Dean. The following were elected:—

President, Professor J. McCunn; *Vice-Presidents*, Dr. S. J. Edwards and Mr. S. L. Hignett; *Treasurer*, Professor N. J. Scorgie; *Hon. Secretary*, Mr. E. K. Price; *Hon. Assistant Secretary*, Mr. J. Stratton; *Council*, Mr. E. C. Hulse, Mr. H. G. Silcock, Miss O. Uvarov, and Miss E. Wilkinson.

There are at present 111 members. It is hoped that all past students of the College will join the Association. To make it easier for members in practice to attend it was decided to hold the annual dinner on a Friday. The 1958 dinner will take place on Friday, June 6th.

THE COLONIAL VETERINARY SERVICE

Mr. G. Froyd, Veterinary Officer, Kenya, has become Veterinary Research Officer, Kenya. New appointments are those of Mr. T. M. Leach, Chief Veterinary Officer, Kaduna, Northern Nigeria, and Mr. R. G. Erskine, Veterinary Research Officer, Federation of Nigeria.

OBITUARY

McINTOSH.—At Cairngower Crieff, Perthshire, on November 2nd, 1957, Rachel Ann, widow of John William McIntosh, F.R.S.E., M.R.C.V.S., and dear mother of Minnie S. Nickinson.

PERSONAL

Births

BALDWIN.—On November 9th, 1957, to Ann, wife of I. J. Baldwin, M.R.C.V.S., of Newstead, Bitteswell, Rugby, a son, Michael John.

DAKIN.—On November 8th, 1957, to Valerie, wife of Gerald W. Dakin, M.R.C.V.S., at Carlisle House, Lindow End, Mobberley, Cheshire, a daughter, Jane Elizabeth.

WILSON.—On October 9th, 1957, at Salisbury, S. Rhodesia, to Doreen, wife of Alan Wilson, M.R.C.V.S., a son.

Marriage

KIRKBY—DUNN.—At The Grosvenor, Glasgow, on October 15th, 1957, by The Rev. W. W. Dornan, M.A., William Weldon Kirkby, B.SC., M.R.C.V.S., son of Mr. and the late Mrs. F. W. Kirkby, to Audrey Helena, daughter of Mr. and Mrs. W. W. Dunn, of Coatbridge, Lanarkshire.

Engagements

CAMERON—MORRIS.—The engagement is announced between Reginald Scott Cameron, M.R.C.V.S., son of Mr. and Mrs. J. H. Cameron of 107, Twyford Road, Harrow, Middlesex, and Helen Morris, younger daughter of Mr. and Mrs. Mervin of 44, Kelsey Road, St. Paul's Cray, Orpington, Kent.

HUGHES—LAMB.—The engagement is announced between Elved John (Max) Hughes, M.R.C.V.S., The Red House, Burgess Hill, Sussex, eldest son of Mr. and Mrs. E. Hughes, Western House Farm, Hurstpierpoint, Sussex, and June Patricia, elder daughter of Mr. and Mrs. A. E. Lamb, Holmesdale, Burgess Hill, Sussex.

COMING EVENTS

November

27th (Wed.). Southern Counties Veterinary Society and N.A.A.S. Joint Grassland Symposium at the Royal Hotel, Winchester, 8.15 p.m.
Meeting of the Scottish Regional Group of the A.V.T. & R.W.s. in the Pathology Lecture Room, The Royal (Dick) School of Veterinary Studies, Edinburgh, 9, 2.15 p.m.

29th (Fri.). Golden Jubilee Dance of the North of Ireland Veterinary Association at the Grand Central Hotel.

December

3rd (Tues.). Meeting of the Lakeland Veterinary Association at the George Hotel, Keswick, 6 p.m.

4th (Wed.). 21st Anniversary Dinner and Dance of the Sussex Veterinary Society at the Regent Restaurant, Brighton, 7 p.m.

5th (Thurs.). General Meeting of the Central Veterinary Society at the Royal Veterinary College, Camden Town, N.W.1, 6 p.m.
Ordinary Meeting of the Ayrshire Veterinary Association in the Ailsa Lounge, Station Hotel, Ayr, 2.30 p.m.

6th (Fri.). General Meeting of the South Wales Division at the Park Hotel, Cardiff, 2 p.m.

11th (Wed.). Ordinary General Meeting of the Sussex Veterinary Society at the Old Ship Hotel, Brighton, 2.30 p.m.
Annual General Meeting of the North Wales Division at the Gwydyr Hotel, Bettws-y-Coed, 2 p.m.

19th (Thurs.). Annual Dance of the V.V.B.F. Ladies' Guild, Dumfries and Galloway Division, in the Cairndale Hotel, Dumfries, 8.30 p.m.

FOOT-AND-MOUTH DISEASE

IN THE COUNTY OF MIDDLESEX

The Boroughs of Willesden, Wembley, Hendon, Finchley Hornsey, Wood Green, Harrow, Enfield, Tottenham, Southgate and Edmonton.

The Petty Sessional Division of South Mimms.

Inn the Petty Sessional Divison of Highgate: The parish of Friern Barnet.

IN THE COUNTY OF HERTFORD

The Boroughs of Watford, St. Albans and Hertford.

The Petty Sessional Divisons of Hatfield, Barnet and Cheshunt.

In the Petty Sessional Division of Welwyn: The parish of Welwyn Garden City.

In the Petty Sessional Division of Hertford and Ware: The parishes of Tewin, Hertingfordbury, Essendon, Little Berkhampstead, Bayford and Brickendon Liberty.

In the Petty Sessional Division of St. Albans: The parishes of St. Michael Rural, Sandbridge Rural, St. Stephen, London Colney and Colney Heath.

In the Petty Sessional Division of Watford: The parishes of Watford Rural, Bushey and Aldenham and so much of the parish of Abbots Langley as lies to the east of the main road (A.41) running from Watford to Kings Langley, including the said road.

IN THE COUNTY OF LONDON

The Metropolitan Boroughs of Hampstead, St. Pancras, Islington and Stoke Newington.

IN THE COUNTY OF ESSEX

In the Petty Sessional Division of Epping: So much of the parish of Nazeing as lies to the west of the road running from Roydon via Clay Hill and Nazeingbury to Waltham Abbey, excluding the said road.

In the Petty Sessional Division of Waltham Abbey: So much of the parish of Waltham Holy Cross as lies to the west of the road running from Nazeingbury via Waltham Abbey to Chingford, excluding the said road.

The County Borough of Southampton, excluding the landing place approved for the purposes of the Animals (Landing from Channel Islands, Isle of Man, Northern Ireland and Republic of Ireland) Order, 1955.

IN THE COUNTY OF SOUTHAMPTON (HAMPSHIRE)

The City of Winchester.

The Boroughs of Eastleigh and Gosport.

The Petty Sessional Divisions of Droxford, Eastleigh and Fareham.

In the Petty Sessional Division of Romsey: The parishes of Ampfield and North Baddesley

In the Petty Sessional Division of Winchester. The parishes of Headbourne Worthy, Kings Worthy, Itchen Valley, Littleton, Abbotts Barton, Sparsholt, Chilcomb, Hursley, Oliver's Battery, Compton, Otterbourne, Twyford, Colden Common and Owslebury.

In the Petty Sessional Division of Petersfield: The parish of Eastmeon.

In the Petty Sessional Division of Alresford: The parishes of Tichborne, Cheriton, Beauworth, Kilmiston and Bramdean and so much of the parishes of Itchen Stoke and Ovington, New Alresford and Bishops Sutton as lies to the south of the railway running from Winchester to Alton excluding the said railway.

IN THE COUNTY OF DORSET

The Boroughs of Blandford Forum and Shaftesbury.

In the Petty Sessional Division of Shaftesbury: The parishes of Motcombe, East Stour, Stour Provost, Cann, Todber, Margaret Marsh, Melbury Abbas, Compton Abbas, East Orchard, West Orchard, Fontmell Magna, Ashmore, Sutton Waldron and Iwerne Minster.

In the Petty Sessional Division of Sturminster: The parishes of Marnhull, Hinton St. Mary, Manston, Sturminster Newton, Hammoon, Child Okeford, Fifehead Neville, Okeford Fitzpaine, Hanford, Shillingstone, Ibberton, Woolland, Stoke Wake and Hazelbury Bryan and so much of the parish of Lydlinch as lies to the east of the road running from Sturminster Newton to Fifehead Neville including the said road.

In the Petty Sessional Division of Blandford: The parishes of Pentridge, Sixpenny Handley, Farnham, Chettle, Tarrant Gunville, Iwerne Courtney and Shroton, Iwerne Steepleton, Stourpaine, Pimperne, Tarrant Hinton, Tarrant Launceston, Turnworth, Durweston, Tarrant Monkton, Bryanston, Langton Long Blandford, Tarrant Rawston, Winterborne Houghton, Winterborne Stickland, Blandford St. Mary, Tarrant Keyneston, Tarrant Rushton, Hilton, Winterborne Clenston, Charlton Marshall, Tarrant Crawford, Milton Abbas, Winterborne Whitechurch, Spetisbury, Winterborne Kingston, Anderson and Winterborne Zelston.

In the Petty Sessional Division of Wareham: The parishes of Morden and Lytchett Matravers.

In the Petty Sessional Division of Wimborne: The parishes of Cranborne, Gussage St. Michael, Wimborne St. Giles, Gussage All Saints, Long Crichel, Moor Crichel, Woodlands, Witchampton, Chalbury, Hinton Martell, Hinton Parva, Pamphill, Shapwick and Sturminster Marshall, so much of the parish of Corfe Mullen as lies to the north of the main road (A35) running from Poole to Lytchett Minster excluding the said road and so much of the parishes of Wimborne Minster, Colehill, Hampreston, West Moors, Verwood, Holt, Horton and Edmondsham as lies to the north and west of the railway running from Poole to Salisbury excluding the said railway.

IN THE COUNTY OF WILTS.

In the Petty Sessional Division of Tisbury and Mere: The parishes of Semley, Anstey, Donhead St. Andrew, Donhead St. Mary, Alvediston, Berwick St. John and Tollard Royal.

In the Petty Sessional Division of Salisbury and Amesbury: The parishes of Ebbesborne Wake and Bower Chalke.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Dunbarton. Little Blairlusk Farm, Ballock, Alexandria (Nov. 15).

Hants. Ashley Farm, Ringwood (Nov. 16).

Yorks. Arnford Farm, Long Preston, Skipton (Nov. 14); Highfield Farm, Denton, Ilkley (Nov. 15).

Atrophic Rhinitis

Co. Durham. Summerville Farm, Durham Road, Stockton-on-Tees (Nov. 15).

Fowl Pest

Cheshire. Kingston Farm, Manchester Road, Hyde (Nov. 13).

Kent. Ashreigney, Sweechbridge Road, Hillborough, Herne Bay (Nov. 15).

Lancs. Brewer House Farm, Lea Town, Preston (Nov. 11); Holmleigh, Runshaw Lane, Shaw Green, Euxton, Chorley (Nov. 12); Woodville, Shaw Green, Euxton, Chorley; The Homestead P.F., Leyland Lane, Leyland, Preston; Holts Farm, Poulton-le-Fylde, Blackpool; Taylors Farm, Shore Road, Banks, Southport (Nov. 13); Porbaricia, Ulnes Walton Lane, Ulnes Walton, Preston; Lane House Farm, Much Hoole, Preston; Bamford Farm, Grange Lane, Hutton, Preston; Lower Shuttlingfield Farm, Gregson Lane, Hoghton, Preston; Oaklea, Runshaw Lane, Shaw Green, Euxton, Chorley; Brickkiln Farm, Skip Lane, Hutton, Preston; Hollins Lane, Leyland, Preston (Nov. 14); Bleakhouse Farm, Lea Town, Preston; Tanners Farm, Mawdesley, Ormskirk; 22, Blackgate Lane, Tarleton, Preston; Shaw Green Farm, Euxton, Chorley; Marsh House Farm, Station Road, Little Hoole, Preston; 3 Woodcock Estates, Lostock Hall, Preston (Nov. 15); Boys Farm, Ulnes Walton, Preston; Woodlands Nurseries, Highfield Road, Croston, Preston (Nov. 16); Hardacre Farm, Hardacre Lane, Whittle-le-Woods, Chorley; Mayfield, Leyland Lane, Ulnes Walton, Preston; Rose Hill, Leyland Lane, Ulnes Walton, Heathwood, Leyland Lane, Ulnes Walton, Preston (Nov. 17).

Yorks. 1, Barnes Cottage, Womersley, Doncaster (Nov. 14); Glebe Farm, Womersley, Doncaster (Nov. 17).

Swine Fever

Anglesey. Carwad Farm, Llaniestyn, Beaumaris (Nov. 14).

Berks. Piggery at Golf Link Allotments, Reading (Nov. 12); Coley Park Farm, Reading (Nov. 14).

Denbighs. Sping Grove, Hugmore Lane, Holt, Wrexham (Nov. 15).

Derbys. Crewe and Harpur Arms, Swarkestone (Nov. 11); Shottle Hall Farm, Shottle (Nov. 14).

Dorset. Droop Farm, Hazelbury Bryan, Sturminster, Newton (Nov. 12).

Essex. 135, Havering Road, Romford (Nov. 12).

Hunts. Spittle Close, Stukeley Road (Nov. 11).

Leics. Scalford Road Allotments, Melton Mowbray (Nov. 11).

Notts. Lodge Farm, Dry Doddington, Newark (Nov. 11).

Oxon. Elmsfield Farm, Chipping Norton (Nov. 12).

Staffs. 138, Dalkeith Street, Walsall (Nov. 14).

Warks. 132, Widney Lane, Solihull (Nov. 11).

Wilts. The Stores, High Street, Great Bedwyn, Marlborough (Nov. 11).

Worcs. Ankerdine Farm, Knightwick (Nov. 13); Gothic House, Evesham Road, Crabbs Cross, Redditch; Tower Farm, Honeybourne, Evesham (Nov. 14).

Yorks. Dairy Farm, High Street, Crofton, Wakefield (Nov. 11th); Field House, Blaxton, Doncaster (Nov. 12).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

V.V.B.F. Christmas Appeal

Sir,—It is customary at this time of the year to remind members of the profession that the Victoria Veterinary Benevolent Fund sends to its recipients early in December a gift from the "Special Gift Account" to enable them to purchase those little extra comforts which will mean so much to them at Christmas.

May we therefore appeal to all who read this letter for their kind support in the good work of the Fund by sending a donation, however small, to the Secretary, 9 Red Lion Square, London, W.C.1.

If on the other hand your readers would prefer to send food parcels direct to the recipients, addresses will gladly be supplied.

Yours faithfully,
H. W. DAWES,
President.

J. McCUNN,
Hon. Treasurer.

J. J. DUNLOP,
Hon. Secretary.

9, Red Lion Square,
London, W.C.1.

November 16th, 1957

The " Rights " of Animals

Sir,—Last Sunday I dined well on beef and to-day I had a most excellent pork chop. How can people have the effrontery to talk about the absolute rights of animals as defined by the dust-coated metaphysicians, prophets, and preachers of the past, when it must be obvious to all of us who enjoy our Sunday lunch, and yet have a certain amount of sensitivity, that animals have no more rights than we as human beings like to afford them?

If I as beef were sent to slaughter, what would I care how you excused your action? In this case I would be an innocent. It would be your problem not mine.

In the end of this ring of reasoning it all revolves around oneself. If after getting up with a bad head one morning one kicks the stable cat, it is a sin—if such a word can be used—to one's personal concept of oneself, usually as a sensitive moral human being. I would not like to make the mistake made by Mrs. Margaret Knight some years back by invoking scientific humanitarianism as the moral authority. It is entirely a personal problem. We must be left to settle our own stomachs both at the dinner table and in practice.

Yours faithfully,
P. N. TRIM.

103, Sutton Road,
Muswell Hill,
London, N.10.

November 15th, 1957.

Sir,—Once again Mr. F. B. Edwards (" Ras " to his college friends) has spoken from his mountain fastness to champion the rights of animals; he is that rare being, a veterinary surgeon who is not afraid of admitting a fondness and respect for creatures lower in the scale of things than himself. His letter in the hey-day of myxomatosis was, in my opinion, one of the best.

In all this high-minded correspondence no one has yet mentioned the fact that for countless years man has relied on animals for meat, milk, clothing, transport, and last but not least for amusement and companionship. For this reason alone man is deeply in debt to all useful and desirable members of the animal kingdom and they have earned their right to a certain " share of the cake."

Sentimentality towards animals is abhorrent to all in practice, in fact, too much experience of it can make one want to go to the other extreme. Unfortunately, in discussion on animals, the people who raise their voices are too often the sloppy sentimentalists on one side and the " down-with-all-animals brigade " on the other; I think the veterinary profession, were it more articulate, could speak up for the practical outlook and sweet reasonableness.

A good comparison between the British and Russian attitude towards animals was seen recently in *The Times* when, in adjoining columns, appeared one article on the progress or otherwise of the fastest bitch in history and another on attempts being made in the North of England to rescue a couple of hunt terriers from an earth.

Mr. Fuller says that he cannot imagine a pack of celestial foxhounds in full cry but I think that few sporting people will contemplate Heaven with much enthusiasm if they believe that horses and hounds will not be among those present, always assuming that the few rogue animals with whom they have had to deal will be consigned elsewhere.

Yours faithfully,
ROSEMARY WELCH.

Rickmansworth,
Herts.

November 17th, 1957.

Electrical Therapy for Recumbent Cattle

Sir,—The application of electrical therapy to recumbent cattle, the subject of Mr. P. Thomas's letter, does not appear to deal with the basic problem. This is to get the cow up on to her feet, and to keep her there.

I have had substantial success by using the hydraulic mechanical muck loader attached to the front end of wheeled tractors. It is always preferable to have the cow away from that abomination of recumbent animals, concrete, and in a field. This can be accomplished by using a gate as a stretcher with a tractor for haulage.

The muck loader is driven above the cow from the posterior extremity and lowered to just over back level. A rope, well padded with sacks, has previously been passed under the cow just anterior to the udder. This is then attached to the tines of the loader and hydraulic lift applied.

The animal is lifted to her feet and may be left supported for a considerable time. The loader should be lowered gradually until the cow will take her own weight.

I am quite aware of the difficulties in this matter. My last subject was a very large, newly-calved Friesian cow recumbent in a tie-up cow shed. She was removed to a field some 300 yards and many obstacles away. As she did not rise after 48 hours she was elevated and kept supported for 24 hours. Recovery was immediate, and milk production during 6 days' recumbency and 1 day " slung " entirely satisfactory.

If a cow will not stand after this treatment I do not believe she is capable of so doing.

Yours faithfully,
J. A. TOOVEY.

Church House,
St. Neots,
Hunts.

November 14th, 1957.

Sir,—I am very interested in Mr. Thomas's letter concerning electrical therapy for recumbent cattle. Electricity is commonly used as a means of persuading animals to move, in the form of an electric pig-goad; in such circumstances it is likely to be a more

humane procedure than beating or kicking, and I can well believe that Mr. Thomas's metnod for dealing with a recumbent cow might be more humane than the usual alternatives employed.

However, I do feel that if the use of electrical methods becomes widespread, there are certain dangers which should be appreciated. When using a stick or other form of mechanical stimulus the operator instinctively assesses the amount of pain he is causing and restrains his activities within the limits of humanity. Assessment of the pain produced by electrical stimulation, however, is extremely difficult and is certainly not instinctive on the part of the operator. It depends, mainly, on the *current* passing through the animal, and although this is partly dependent on the applied voltage, it is also affected by many other factors such as electrical resistance and will vary widely from one animal to another when the voltage remains constant.

It is always possible that the motor nerves of an animal may be damaged, or the nerve-muscle junctions or the muscles themselves, without corresponding damage of sensory nerves. In such cases the animal would be unable to respond to the stimulus, but would be fully sensitive to pain; there might then be a great temptation to increase electrical stimulation (in magnitude or duration) beyond the limits of humanity in an attempt to produce a response.

I would like to conclude by saying that I think Mr. Thomas's suggestions could be extremely useful in therapy and diagnosis, but I think they should only be applied by those who are familiar with the effects of electricity on living tissue.

Yours faithfully,
PHYLLIS G. CROFT.

Fairmead,
High Beech,
Loughton,
Essex.

November 18th, 1957.

Restraint in Wild Animals

Sir,—The problem of restraining captive wild animals in order to treat them medically or surgically is a very real one. Such creatures cannot readily be confined in small spaces for any great length of time. Their ability to adapt themselves to environmental changes is far less evident than it is in the domestic animal, hence it is not without risk to enclose a wild animal, even in a well-designed crush box for such purposes as carrying out minor operative procedures, as it is not unknown for a " boxed " animal to die suddenly without any obvious cause.

In my resolve to discover a technique for restraining these animals, taking into account their hypersensitivity and inherent suspicion, I have been using a new group of chemotherapeutic agents, which have been widely used to treat mental disease in humans. One such drug, which has yielded promising results, is a phenothiazine derivative known chemically as 10(N-methyl-3-piperidyl-methyl)-phenothiazine.*

* Pacatal Veterinary.

Case No. 1

A male orang-utan aged approximately 6 years was presented at the hospital early 1957. The animal seemed debilitated and wretched and was thin, hairless, and unfriendly.

The history was that it had been shunned by its cage companions, two female orang-utans, and as a result of this had become morose and sulky and, indeed, aggressive. At first no one could handle the animal or, indeed, get near it without it flying at the cage in a savage attempt to attack.

A scaly skin condition was in evidence and it was desirable to take a skin scraping. To facilitate this, Pacatal was administered orally at the rate of 150 mg. per day, the drug being masked in the animal's food. Within 24 hours the animal had become much calmer, and in 48 hours allowed a skin scraping to be taken. Pacatal was administered daily for a period of 14 days and, presumably due to the calming effect, the animal began to eat well and was extremely friendly.

The skin condition cleared spontaneously and the hair began to grow rapidly. Eventually the animal returned on exhibition, fat and fit and with an amicable disposition.

Case No. 2

The female maned wolf aged approximately 2 years and weighing about 60 lb. had a fractured and luxated claw on the off-hind foot. Amputation was indicated but approaching the animal presented problems. The maned wolf has long, fragile legs and is by nature extremely nervous and cautious. Therefore any form of force was impracticable. It was decided to employ Pacatal in an endeavour to calm the animal sufficiently for her to be safely shepherded into a box for transfer to the hospital.

To test the effects of Pacatal, 150 mg. twice daily was administered disguised in dates. For the first day the response was slight, and on the second day dosage was increased to 300 mg. twice daily, when the response was much better. On the third day a single dose of 300 mg. was administered and 2 hours later the wolf was quietly guided into her box. In herself she seemed quite alert to stimuli and had no obvious desire to sleep.

On arrival in the hospital an attempt was made to restrain the animal's hind leg for intravenous anaesthesia, but this was resisted. There was no difficulty, however, in pulling out a fore leg and thiopentone sodium anaesthesia was administered intravenously into the left radial vein. Recovery from the anaesthetic was slow and narcosis prevailed for 48 hours, probably due to the potentiating effect of Pacatal. Recovery was uneventful.

By way of interest, the male maned wolf was also tranquillised to prevent him from disturbing the female, both in the pre-operative and post-operative phases.

These two cases would seem to indicate that Pacatal might have a place in tranquillising some species of wild animals and that, further, it may be of assistance in aiding a wild animal to adapt itself to strange environment.

Those people experimenting on monkeys and experiencing the devastating bowel disorders which can occur may well discover that an early administration of Pacatal given over a period of 7 days after arrival might remove results of shock and fear in the critical first few days of establishment.

Yours faithfully,

OLIVER G. JONES,

Curator of Mammals and Veterinary Officer.

Zoological Society of London,
Regent's Park,
London, N.W.1.

November 14th, 1957.

Tranquillisers

Sir,—The lay press has been giving a good deal of publicity to the subject of tranquillisers, more especially with reference to their use at dog shows. Since I have been interested in their use for some time I should like briefly to record my personal experiences.

My chief interest in their use has been connected with dogs entering strange kennels or being kennelled for the first time. Under these conditions most dogs suffer from nervousness and anxiety, and this affects their conduct quite apart from the dog who is an habitual barker.

I have experimented with various tranquillisers and have found one of them, chemically 10(N-methyl-3-piperidyl-methyl)-phenothiazine,* to give very satisfactory results.

In the nervous subject this drug controls apprehensiveness and the tendency to whine and bark. The drug can often be discontinued after a few days when the animal has settled down.

In the case of the dog that continues to bark, the treatment must be maintained for a longer period and in some cases for the entire time the animal is hospitalised.

For those who have kennels in residential districts I recommend a trial with this drug. The dose will vary from animal to animal, but in the main I find that one tablet (25 mg.) is sufficient. I have, however, been obliged to administer as many as 4 tablets before getting results. The dogs so treated appear normal in every way but become placid and more manageable than before administration. Pacatal was supplied by the courtesy of William R. Warner and Co. Ltd., Eastleigh, Hampshire.

Yours faithfully,

S. F. J. HODGMAN.

The Animal Health Trust,
Canine Health Centre,
Kennett,
Nr. Newmarket,
Suffolk.

November 18th, 1957.

* Pacatal.

New Veterinary Organisations

Sir,—May I seek the courtesy of your columns to reply to the letter written by Mr. Harold Smith which appeared in your issue dated November 16th, 1957.

Unfortunately, Mr. Smith starts off on the wrong foot by appearing to assume that the newly-formed B.S.A.V.A. is in fact a Division of the B.V.A. Although, Sir, you very kindly publish notices of our regional meetings and details of our activities in THE VETERINARY RECORD from time to time, the question of Divisional status with the B.V.A. has not yet arisen officially. Whether this will come about at some time in the future must be decided by our members and the B.V.A. Council.

The desire, and if I may say so, the necessity for the Association is reflected by the fact that in the eight months since our inaugural meeting 300 members of the profession have joined the Association which is led by a representative committee entirely agreed on the principles of our conception and how these shall be put into effect.

The purpose of the Association was admirably stated in your Editorial of March 23rd (*Vet. Rec.* **69.** 356), in which you referred quite rightly to the increasing tendency for individual members to specialise. This is apparent even in many mixed practices employing more than one person, and is obviously highly desirable in view of the rapid advances in techniques and knowledge associated with the many aspects of research in veterinary science. We consider that it is highly important for persons engaged wholly or partly in small-animal practice to have every opportunity for the development of their subject. Consequently the B.S.A.V.A. has commenced to organise regional meetings where an exchange of ideas, information, and opinions may take place. It is not intended that these meetings should follow the orthodox pattern but rather that they give an opportunity for discussion between small groups of veterinary surgeons; consequently it is difficult to see why any friction should arise between these groups and B.V.A. Divisions.

It is felt that small-animal practitioners are not always well served by B.V.A. Divisional meetings which in the provinces are quite naturally more concerned with large-animal matters. In some districts, for instance, only one "small-animal" meeting is arranged each session. In practically all these areas there is a small core of predominantly small-animal practitioners who will welcome the opportunity of meetings devoted to their own interests. Incidentally, most B.S.A.V.A. meetings have already adopted the idea of holding meetings at different centres to benefit members.

A publication has also been produced which will be circulated at regular intervals containing abstracts from *world* literature so that the busy practitioner may be acquainted with the progress being made and can widen and improve his approach to everyday problems. In addition the information published regarding current research work and ancillary aids to diagnosis available in this country is expected to be of particular value.

Another very important aspect of the Association's function is that as a result of regional meetings, practitioners will become better acquainted and it is highly probable that difficulties in professional

relationship will diminish and greater co-operation and friendship will replace the misunderstanding and suspicion which, all too frequently, exists between neighbours. A better understanding and unity of purpose between colleagues can only help in defeating the factors which threaten many practitioners to-day.

Mr. Smith states that the people concerned in this organisation would be better employed in serving the profession in other ways. Of course, we firmly believe that professional interests are being fostered, and as one might expect much active support has come from people who are already serving the profession admirably, for instance two members of the executive committee are past-Presidents of the B.V.A. and some others serve on the B.V.A. Council.

One of our first actions as an Association was to elect a P.R.O., and each region (there are 11 regions in all) has elected or will elect a regional P.R.O. These representatives will fulfil at least one service advocated by Mr. Smith, namely to present the professional point of view in the lay press; but as they will speak for a strong and highly representative Association they will carry greater authority than the individual can ever hope to achieve.

Yours faithfully,
W. BRIAN SINGLETON,
Hon. Secretary, B.S.A.V.A.

" Pentlands,"
Moulton Road,
Kennett,
Nr. Newmarket.

November 18th, 1957.

Hormones and Leather Quality

Sir,—For long enough there has been a fault phenomena in hides which has given rise to many opinions as to its cause. It is only manifest in cow hides which are split to give upholstery leather and only the corium, or inner split, gives rise to the fault. The fault lies on the butt close to each side of tail head of the hide, spreading mostly forward to the plate and constitutes a complete "fall out" of the corium layer after tanning and splitting. The "fall out" can be from the size of a saucer to as large as a soup plate, and microscopic examination of the damage to the corium shows a breakdown of the fibrillary protein structure.

Bacterial contamination, bad handling and salting in the hide markets, quality of the salt used, all have been blamed. The British Leather Research have recently concluded elimination trials, one of which was processing in a tannery hides in fresh condition within a few hours of take-off in a nearby slaughterhouse, when it was found that the fault was still there but *only on cow* hides; nor was it in every cow hide. Veterinary consultant opinion was that it could be attributed possibly to female hormones.

The exchange of fat deposits of a cow (particularly around the pelvic bones) according to its lactation and condition are well known, but one would think that such deposits would also cause a breakdown in the structure of the outer grain layer of the hide, but this is not affected.

This fault was in being long before the recent introduction of hormone application to achieve increased live-weight gains, but what of the future? In view of remarks now being made in meat markets of the recent peculiar "cutting out" of some carcases, peculiar tints in the flesh in parts, and shorter keeping qualities of some meat, surely some attention should be paid to recent work which shows important changes in the "quality" of the increased "quantity" of weight gains.

Yours faithfully,
R. G. McQUEEN.

W. & J. Dunlop Limited,
Veterinary Dept.,
Dumfries.

November 12th, 1957.

ADVERTISER'S ANNOUNCEMENT

Saffelin, a purified and improved biological for immunising sheep and lambs against pulpy kidney disease, was marketed by GLAXO LABORATORIES LTD. on November 12th. It is the Company's first veterinary immunological.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period		Anthrax	Atrophic Rhinitis	Foot-and-Mouth	Fowl Pest	Sheep Scab	Swine Fever
1st to 15th October, 1957		13	1	30	48	—	37
Corresponding period in	1956	15	2	11	41	—	38
	1955	31	—	—	24	—	44
	1954	16	—	—	13	—	40
1st January to 15th October, 1957 ...		270	7	94	668	—	764
Corresponding period in	1956	1,161	10	127	557	—	630
	1955	580	5	6	425	—	1,182
	1954	237	4	12	615	—	1,202

TUBERCULOSIS (ATTESTED HERDS) SCHEMES

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at 30th September, 1957, was as follows :—

ENGLAND	WALES	SCOTLAND	TOTAL (GREAT BRITAIN)
102,969	36,213	41,689	180,871

TUBERCULOSIS ORDER OF 1938

The number of bovine animals slaughtered under the Tuberculosis Order of 1938 during the period 1st July to 30th September, 1957, was 172.